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Does covid-19 affect pregnancies?

The coronavirus has been linked to adverse pregnancy outcomes, but vaccines help to keep mothers and babies safe, reports **Michael Marshall**

BEING pregnant at the height of the covid-19 pandemic was profoundly challenging. Many had to give birth without their partners present and new parents found themselves locked down with little or no outside support.

On top of this, there was the fear of covid-19 itself. At the start of the pandemic, we had hardly any information about how the infection affected pregnancies or newborns. But, three years on, we have a much clearer picture – and it particularly supports vaccination.

Pregnancy risks

The pandemic has undoubtedly had negative consequences for pregnancies. A 2022 US study followed 1.6 million pregnant people across 463 hospitals, with half of the pregnancies occurring during the pandemic and the rest in the year before it began. Maternal death rates were higher during the pandemic, at 8.69 fatalities per 100,000 pregnancies, compared with 5.17 per 100,000. A statistical analysis suggests this wasn't a chance finding.

A study published in January compared 115 babies born before the pandemic with 115 infants born to mothers who had covid-19 while pregnant. Thirteen of the pandemic babies didn't reach developmental milestones expected between 6 and 8 months of age, compared with none of the pre-pandemic babies. Whether the negative outcomes were due to the virus itself, the experience of being pregnant and giving birth during a pandemic or other factors isn't entirely clear. "We were fighting an enemy we'd never seen before and we didn't have too much time to think about it," says Alessio Fasano at Harvard Medical School.

We now know that pregnant people are no more likely to catch



ANTHONY WALLACE/AFP VIA GETTY IMAGES

the SARS-CoV-2 coronavirus than anyone else, but, if they do, there can be extra risks. A 2022 review compiled 435 studies on almost 3.2 million women with covid-19. Those who were pregnant or recently pregnant were more likely to be admitted to intensive care and given invasive ventilation than the other women.

8.69

Maternal deaths per 100,000 pregnancies during the height of the covid-19 pandemic

5.17

Maternal deaths per 100,000 in the year before covid-19 emerged

89%

Vaccines' effectiveness against covid-19 hospitalisations when given during pregnancy

Several systematic reviews also suggest covid-19 is associated with a higher risk of adverse pregnancy outcomes. One review of 42 studies included 438,548 pregnant people, finding that infection during pregnancy was linked with higher risks of pre-eclampsia, preterm birth and stillbirth. A 2022 study of 3545 women in the UK found that infection during the first trimester was associated with a higher risk of miscarriage, at rates of 14 per cent among women who self-reported being infected, compared with 8 per cent for those who didn't.

However, while rates of stillbirth, for example, may be higher with SARS-CoV-2, they are still low overall. In one analysis, there were six stillbirths in 1000 pregnancies in people who didn't have covid-19, compared with 13 stillbirths per 1000 pregnancies in people who had covid-19.

For preterm birth, infection timing seems to be key. A 2022 study found catching SARS-CoV-2

A pregnant woman walking in Hong Kong in March 2020

in the first 27 weeks of pregnancy wasn't associated with premature birth, but the risk rose sevenfold if infected after 34 weeks.

Overall, the third trimester seems to be the riskiest, "probably because the heavily pregnant uterus compresses the lungs more than in early pregnancy", says Asma Khalil at St George's University Hospital in London.

When it comes to preterm births specifically, there is no evidence that the virus itself is to blame, with any increased risk probably being due to medical intervention, says Khalil. "When the mother is unwell, doctors are more likely to deliberately deliver the baby early, so its mother can be treated more effectively."

The good news is that covid-19 vaccines are effective during pregnancy. A 2022 review

compiled evidence from 25 studies and found “overwhelming support” for vaccinating during pregnancy to reduce the risk of infection and severe illness.

In a 2021 study, researchers led by Ran Balicer at the Clalit Research Institute in Tel Aviv, Israel, compared 10,861 pregnant women who were vaccinated during pregnancy with 10,861 unvaccinated pregnant women. None had previously had covid-19. Among vaccinated participants, the shots were 96 per cent effective against infection, 97 per cent against symptomatic infection specifically and 89 per cent against hospitalisation.

Support for vaccines

Vaccinating also has benefits for the fetuses, reducing the risk of stillbirth by 15 per cent, according to a 2022 review led by Khalil. Its protection can also be transferred to newborns. A study in March found that vaccination during pregnancy reduced a baby’s chances of infection by covid-19 during their first six months of life.

Alongside the vaccines’ effectiveness, they have also been shown to be safe. In two 2022 studies, Deshayne Fell at the Children’s Hospital of Eastern Ontario, Canada, and her team tracked people who were vaccinated while pregnant. In one study, they followed 97,590 people who gave birth between December 2020 and September 2021, almost a quarter of whom received at least one vaccine while pregnant. These participants weren’t at an increased risk of negative pregnancy outcomes, such as haemorrhaging or being admitted

to a neonatal intensive care unit.

In the other study, the team followed 85,162 births. Just over half of the pregnant individuals received a vaccine during their pregnancy, with no increased risk of preterm birth or stillbirth.

Despite the vaccines’ benefits, there is a debate over whether to offer pregnant people booster

“At the start of the covid-19 pandemic, we were fighting an enemy we’d never seen before”

shots. A 2023 study showed these produced strong antibody responses in pregnant women. Meanwhile, in a study in February, Sarah Jorgensen at the University of Toronto and her colleagues found that a third vaccine during pregnancy gave infants additional protection against the dominant omicron variant.

In countries such as the UK, US and Australia, pregnant people are encouraged to get vaccinated against SARS-CoV-2, but there are no programmes offering covid-19 boosters during pregnancy.

Since the covid-19 vaccines were first introduced, debates over whether to offer them at all during pregnancy have been fraught, leading to poor communication

Can SARS-CoV-2 infect a fetus during pregnancy?

Early in the pandemic, researchers wondered whether the coronavirus could cross the placenta to infect the fetus. Initial reports suggested it couldn’t, but towards the end of 2020, Katie Long at King’s College London and her colleagues noticed bleeds in the brain cortices of fetuses, using samples from aborted pregnancies. “We found that haemorrhages were always associated with the presence of SARS-CoV-2 in that fetal brain tissue,” she says. They concluded that the virus crossed into the fetuses, weakening the blood vessels in their developing brains.

It was a dramatic finding, but we don’t know if the bleeds

were harmful to the developing fetuses. There was no sign in the clinical records that covid-19 was a factor in the terminations.

Nevertheless, a study in April from another group reported two newborns with seizures and brain damage whose mothers had SARS-CoV-2 towards the end of their pregnancies. When one of the babies died at 13 months old, evidence of the virus was found in their brain.

Overall, it is considered rare for the virus to cross the placenta. Most babies born to mothers with covid-19 don’t test positive for it, says Asma Khalil at St George’s University Hospital in London.

and confusion. In 2021, Khalil and her colleagues found that less than a third of eligible pregnant women accepted covid-19 vaccinations. A review published in February 2023 found that pregnant women were still less likely to accept the vaccine than non-pregnant women.

Pregnant people have undoubtedly been harmed as a result. In February 2022, data from six European countries showed

that severe covid-19 in pregnancy was “almost exclusively limited to unvaccinated women”.

Earlier in the pandemic, physicians weren’t sure whether vaccinating during pregnancy was for the best, says Jorgensen. However, that wasn’t unique to covid-19. Pregnant people are often excluded from clinical trials, making the safety and efficacy of new drugs and vaccines in these individuals unclear. In a 2021 study, Jorgensen and her colleagues examined 376 trials published between 2017 and 2019: only 5.3 per cent included pregnant people. Amid covid-19, Harriette Van Spall at McMaster University in Ontario, Canada, wrote in a paper that excluding these participants from vaccine trials was “a missed opportunity”.

Granted, working with pregnant people is sensitive, says Katie Long at King’s College London. But the result seems to be lower uptake of life-saving vaccines. ■

A baby after it was born in a hospital in Istanbul, Turkey, in May 2020



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